

live *Pitar pollicaris* Cpr. as large as the one in the collection of the Academy of Natural Sciences in Philadelphia. This seems to be one of the rarest of the Mexican bivalves. *Venus vulnerata* Brod., *Terebra*, *Polynices*, and *Olivella* were also plowing up these same sand bars which were exposed a quarter of a mile from shore at the extreme low tide.

(To be continued)

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#### OBSERVATIONS ON MONTACUTA PERCOMPRESSA DALL

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On August 25th of this year (1932) Mr. F. W. Wamsley, our veteran collector and preparator, brought to me four *Synapta inhaerens* (the sand holothurian), wanting me to look at the small molluscs which were attached to them—one to each *Synapta*.

He said that this was not the first time he had found these molluscs on the *Synapta* when digging for the latter. He and others had been out that morning digging *Synapta* for use at the Laboratory and these four were the only ones he noticed having the molluscs on them. I was delighted to get them. They proved to be *Montacuta percompressa* Dall.<sup>1</sup> As the *Synapta* were needed for other work I carefully removed each mollusc from its host and was surprised at the tenacity with which they stuck to the *Synapta*. By taking the mollusc with forceps or finger and thumb and gently lifting to separate it from the *Synapta*, I have sometimes raised the latter free from the water before the mollusc let go, so strongly was it fastened to its host, and one crushed in the forceps before removal. I kept them over night in a small dish of water. I had another dish with one or two *Tellina* in it and the next morning, thinking I would consolidate, I put the *Tellina* in with the *Montacuta*. Shortly after I noticed eggs

<sup>1</sup> This identification was confirmed by Dr. Pilsbry and Mr. Vanatta.

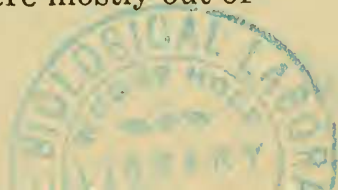
in the dish. Every indication was that these eggs were laid by the *Montacuta*. The molluscs lived a few days, but fearing I might lose them I finally preserved them. The foot evidently penetrated the outer wall, or skin, of the Synapta. When free from the latter they would extend the foot and crawl about. Frequently the foot extended out farther than the length of the shell. They were very active, continually thrusting out the foot, and in life showed a beautiful velum.

A few days after these were brought to me, I went to the same place from which these were collected and though I dug and sifted until my time was up, I secured only a few Synapta, without the *Montacuta* and none of the latter were observed at all. I was of course disappointed in not finding them. October 1st, I went to the Bay shore and dug several Synapta and found two, each of which had a *Montacuta* attached.

October 25th, I took another trip to the Bay shore to see if I could get *Montacuta* free and separate from Synapta. The tide was higher than on the previous trip and there was some ripple on the water, so that it was not so favorable a time for seeing the bottom. In smooth water, and also where the sand flats are bare, the little elevations of sand and the holes made by the Synapta can frequently be seen so that one can dig with a spade for Synapta with more assurance of success than with indiscriminate digging. However at this time the digging was done more or less at random and for nearly two hours. In two or three instances of this promiscuous digging I obtained two specimens of *Montacuta*, but in each case there was also one or more Synapta in the sieve with the *Montacuta*, so that it was almost impossible to decide whether they were originally on the Synapta or loose in the sand.

It must be borne in mind that in all this collecting I dumped each spadeful into a fine wire sieve and carefully sifted the material. The *Montacuta* might have loosened from their host by sifting or might have been loose in the sand.

On October 31st I went again to the Bay shore for *Montacuta*. The tide was very low and the flats were mostly out of



water. Digging and sifting was carried on until too tired to work longer and the only *Montacuta* obtained were two which were found attached to *Synapta*, one to each. It was noticed that one of these was attached as much as two inches below or behind the head end of its host and as the *Synapta* was nearly perpendicular in the sand, *Montacuta* was at least two inches below the surface of the sand. *Synapta* has more or less of a burrow and this would apparently give *Montacuta* greater freedom, and prevent suffocation. I think there are times when it may be deeper. In spite of all the digging done in this area, I have no conclusive proof that *Montacuta* is free, loose, and separate from *Synapta*, though I cannot see why it should not be.

All of the *Montacuta* thus far brought in have to the best of my knowledge been attached to this sand holothurian, *Synapta inhaerens* (O. F. Müller)—*Leptosynapta girardii* (Verrill).

A few times I have tried putting a *Synapta* in with *Montacuta*. Sooner or later they would be found adhering to the former and one time three were attached to the same host.

The places where most of the *Synapta* have been taken by our collectors and where *Montacuta* has been found attached are generally sandy flats without much, if any, mud mixed in, though it is perhaps possible that they may be found in more or less muddy sand; but usually in quite clear sand, from between tides to beyond low tide mark, and many times these flats are entirely out of water.

Verrill in his "Invertebrates of Vineyard Sound and Adjacent Waters," 1874, mentions *Montacuta elevata* as occasionally occurring on shelly bottoms, but were seldom obtained alive. Pratt in his "Invertebrate Animals" does not mention *Montacuta* at all, that I can see. Johnson in his list of Mollusca published in 1915 says, "Mass.,—'at the 'Gutters' Naushon Island, near Woods Hole." Sumner, in his "Biological Survey," 1911, seems to have quoted from Verrill thus,—"Gut of Canso and 'gutters' of Naushon in sand and mud below low water mark." Gould and Binney mention *M.*

